

TABLE 2

Perlite Property	Hess Perlite	Silbrico #1	Silbrico #3 Comparative Example
Particle Size Distribution, larger			
100 microns	74.59%	45.86%	58.30%
275 microns	71.61%	39.63%	36.99%
480 microns	67.19%	32.67%	10.23%
700 microns	56.00%	26.85%	3.66%
Board Properties			
NRC	0.68	0.70	0.40
MOR, psi	205	286	224
Density, pcf	20	24	21

Silbrico #3 perlite, having a more conventional particle size distribution, produces a product that is inferior to perlites having a greater number of large particles. Expanded perlites having more than 20% of the particles greater than 700 microns resulted in board having better MOR and higher NRC.

While a particular embodiment of the high strength acoustical panel has been shown and described, it will be appreciated by those skilled in the art that changes and modifications may be made thereto without departing from the invention in its broader aspects and as set forth in the following claims.

What is claimed is:

1. An acoustical product comprising:  
a matrix of calcium sulfate dihydrate crystals;  
a lightweight aggregate distributed throughout the matrix, said lightweight aggregate having a bimodal particle size distribution curve having a first maximum in the range of 500 to 2000 microns and a second maximum in the range of 10 to 100 microns, and wherein the ratio of lightweight aggregate to calcium sulfate dihydrate ranges from about 35% to about 75% by weight, based upon the dry weight of the calcium sulfate dihydrate;

- a foaming agent comprising at least one of alkyl ether sulfates and sodium laureth sulfates;  
a dispersing agent; and  
long reinforcing fibers distributed throughout said calcium sulfate dihydrate matrix.
2. The product of claim 1 wherein said long reinforcing fibers have a fiber length of about ¼ inch to about 1 inch.
3. The product of claim 1 wherein said lightweight aggregate is expanded perlite.
4. The product of claim 3 wherein said expanded perlite is treated with a coating.
5. The product of claim 4 wherein said coating comprises at least one of the group consisting of a silicone compound, a film-forming, thermoplastic polymer and combinations thereof.
6. The product of claim 1 further comprising a strength enhancing additive.
7. The product of claim 6 wherein said strength enhancing additive is a trimetaphosphate compound.
8. The product of claim 1 further comprising at least one of a starch, a binder and a dispersant.
9. The product of claim 1 wherein said product is an acoustical ceiling product.
10. The product of claim 1 wherein said product is an acoustical gypsum board panel.
11. The product of claim 1 wherein said calcium sulfate dihydrate comprises hydrated calcium sulfate hemihydrate of the alpha form or beta form.
12. The product of claim 1 wherein said acoustical product further comprises an acoustically transparent facing on a front face and a paper facing on a back face.
13. The product of claim 1 wherein said bimodal particle size distribution comprises at least 20% by weight of the aggregate having a particle size of 700 microns or larger.
14. The product of claim 13 wherein said bimodal particle size distribution comprises at least 25% by weight of the aggregate having a particle size of 700 microns or larger.

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